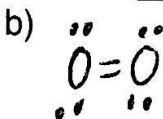


Properties/ Bonding Review

Covalent bonding occurs when **two or more NON-METALS** share electrons, attempting to attain a stable octet (8 outer electrons) in their outer shell for at least part of the time.

a) **Draw** a Lewis dot diagram for each element listed. **Circle** each atom and the electrons that it will share b) Then **draw** the bond structure using symbols and lines. Use one line for each pair of electrons that is shared.

1.) Oxygen ----- What type of bond is this? double



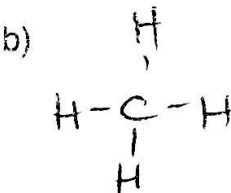
2.) Nitrogen ----- What type of bond is this? TRIPLE



3.) Boron and Fluorine



4.) Carbon and Hydrogen

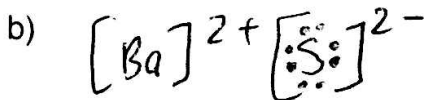


IONIC BONDING:

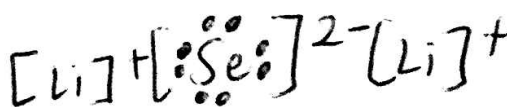
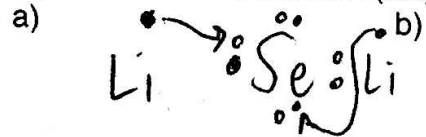
occurs when a **METAL** bonds with a **NON-METAL**, electrons given up by metals and are taken by non-metals to attain a stable octet (8 outer electrons) in their outer shell giving atoms a charge (making them ions!!). These charged atoms or ions are attracted to one another by electrical attraction (positive attracted to negative/opposites attract).

a) **Draw** a Lewis dot diagram for each element listed then **show** the transfer of electrons using an **arrow**. b) **Draw** the element symbol surrounded by the electrons in their final position. These diagrams should be in brackets with the ions charge or OXIDATION NUMBER outside of the brackets.

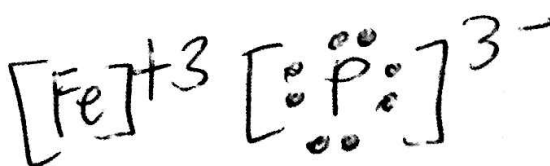
1.) Barium (Ba) and Sulfur



2.) Lithium and Selenium (Se)



3.) Iron (+3) and Phosphorus



Types of Chemical Bonds :

Classify the following compounds as ionic (a metal + a nonmetal), covalent (a nonmetal + a nonmetal) or both (a compound containing a metal and a polyatomic ion)

In the other column list the number of atoms in each compound.

Type of Bond

List each atom and how many are in the compound. Follow the example below.

1.) CaCl_2 IONIC

Ca = 1 Cl = 2

2.) CO_2 COVALENT

C = 1 O = 2

3.) H_2O COVALENT

H = 2 O = 1

4.) $\text{Sr}_3(\text{PO}_4)_2$ IONIC

Sr = 3 P = 2 O = 8

5.) K_2O IONIC

K = 2 O = 1

6.) NaF IONIC

Na = 1 F = 1

7.) $\text{Al}_2(\text{CO}_3)_3$ IONIC

Al = 2 C = 3 O = 9

8.) CH_4 COVALENT

C = 1 H = 4

Ionic or covalent (you may need to look up to formulas if you can't make a decision based on the properties):

1.) Baking Soda IONIC $\rightarrow \text{NaHCO}_3$

2.) Glass COVALENT $\rightarrow \text{SiO}_2$

3.) Butter COVALENT $\rightarrow \text{DEPENDS} \rightarrow \text{HYDROCARBONS}$

4.) Gasoline COVALENT $\rightarrow \text{DEPENDS} \rightarrow \text{MAINLY HYDROCARBONS}$

5.) Chalk IONIC CaCO_3

What is a valance electron?

OUTER SHELL ELECTRON

What is an oxidation number?

THAT TELLS HOW MANY ELECTRONS WILL BE ACCEPTED OR DONATED

What is the oxidation number for:

1.) Argon 0

4.) Polonium (Po) -2

2.) Sodium +1

5.) Tin +4

3.) Radium (Ra) +2

6.) Arsenic (As) -3

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What is a metallic bond? What property of matter is reliant on these metallic bonds?
METALS BOUND TOGETHER - RESULTING IN A CLOUD OF ELECTRONS - CONDUCTIVITY OF ELECTRICITY AND HEAT

Most metals are in what state at room temperature? (solid, liquid or gas)
SOLID

What is the only metal that is a liquid at room temperature?
MERCURY

What state are most non-metals in at room temperature?
GAS

What state are all ionic compounds in at room temperature?
SOLID

What makes period 7 so unique?
RADIOACTIVE

Fill in the table:

Group Number	Group Name	# Valence Electrons	Will it GAIN or LOSE electrons to fill its outer shell?	Charge of the Ion
1	Alkali Metals	1	LOSE	+1
2	ALKALINE EARTH METALS	2	LOSE	+2
3	BORON FAMILY	3	LOSE	+3
4	CARBON FAMILY	4	EITHER	+/- 4
5	NITROGEN FAMILY	5	GAIN	-3
6	OXYGEN FAMILY	6	GAIN	-2
7	HALOGENS	7	GAIN	-1
8	NOBLE GASES	8	NEITHER	0

True or False (correct if false):

1.) T or F **Ductility** refers to a metals ability to be hammered into sheets.
MALLEABILITY

2.) T or F **Malleability** refers to a metals ability to bend without breaking or to be hammered out into sheets.

3.) T or F **A salt** is a combination of a non-metal and an atom from the halogen family
METAL

4.) T or F **Iodine** is essential for the function of the thyroid

5.) T or F **Alkaline earth metals** are the most reactive elements on the periodic table
ALKALI METALS

6.) T or F **Transition elements** can have multiple oxidation numbers

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Are noble gases reactive? Why or why not?

No - THEY HAVE A FULL OUTER SHELL

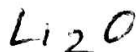
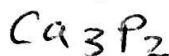
What is an ion?

CHARGED ATOM

What is a polyatomic ion?

GROUP OF ATOMS ACTING AS AN ION

Use the ion criss cross to write the formula for each compound.

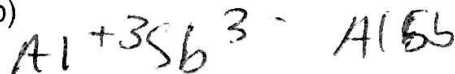
1.) Li^+ O^{2-} 2.) Ca^{2+} P^{3-} 3.) B^{3+} I^- 

Find the charge on each type of atom and write the formula for each compound using the ion criss cross:

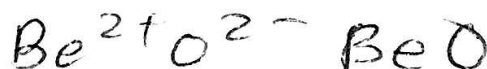
1.) Sodium and Iodide



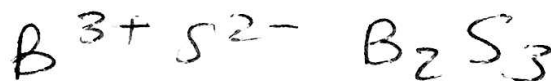
2.) Aluminum and Antimony (Sb)



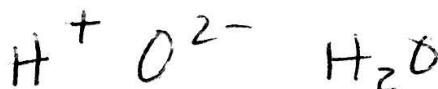
3.) Beryllium and oxygen



4.) Boron and Sulfur



5.) Hydrogen and Oxygen

~~6.) Chlorine and Chlorine~~

Magnesium

7.) Sulfur and ~~Bromine~~~~Bromine~~
Barium

Be sure to review your notes, the properties packet, the web quest, the activities we have done and any homework assignments or extra practice worksheets!

Some of you really need these points - be proactive and STUDY STUDY STUDY!